PS 1-081

## DETECTING HUMAN SERUM ALBUMIN USING SCREEN-PRINTED CARBON ELECTRODE BY CYCLIC VOLTAMMETRY

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**Purpose**: Electrochemical analysis is a powerful tool for analyzing interfacial reactions as well as composition of analytes. In this study, we made a low-cost, portable, and easy-to-use instrument consists of hardware and software for electrochemical analysis. The cost of our design is 1/1000 fold to compare with commercial systems, and the weight of this device is light for 120 grams. Finally, this study used this portable device to detect human serum albumin (HSA) by cyclic voltammetry analysis employing screen-printed carbon electrode (SPCE).
**Methods**: In this study, we made a portable device which consists of hardware and software in it. The hardware part consists of PCB and electrical elements on the PCB. We used ATXmega32A4 as the microcontroller, and TLC2264ID as OP amplifier. The software part was written by C language and compiled with AVR studio. We used homemade instruments to detect HSA with CV with SPCE. All the solutions were prepared at room temperature ( 25 ± 2°C ) and DI water. The concentration of HSA is 0—450 mg/L.
**Results**: Figure shows the CV response of the detection of HSA. With adsorption of HSA on the electrode, we can observe that the peak current decreases when the concentration of HSA increases. This is due to the adsorption of HSA hinders transfer of electrons between electrode and the solution.

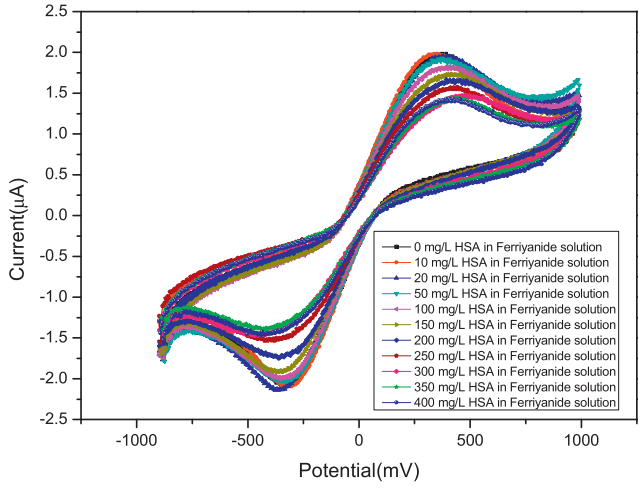


**Figure** CV response for the detection of HSA from 0 mg/L to 450 mg/L in 0.1 M ferricyanide solution containing 10 mM PBS.
**Conclusions**: The portable device could detect the HSA successfully, and show the homemade portable device has great potential to apply in Point of Care system for routine checking.

PS 1-082

## SURVEILLANCE AND CONTROL OF *CLOSTRIDIUM DIFFICILE* OUTBREAK IN AN ACUTE CARE HOSPITAL IN A DEVELOPING COUNTRY

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**Purpose**: This descriptive study aims to increase the awareness on *Clostridium difficile* infections as an important cause of morbidity in hospitalized patients. Educate clinicians that source identification, institution of infection control policies together with an effective antimicrobial stewardship program can control an outbreak of *Clostridium difficile* infections in an acute care hospital even in a developing country such as the Philippines.
**Methods**: Descriptive retrospective study based on active surveillance for twelve - months (January — December 2013) was conducted. All patients who met the criteria for the diagnosis of *Clostridium difficile* infection were included in the study. *Clostridium difficile* Toxin A and B II for fecal specimen is used to detect *Clostridium difficile* infection. Environmental surveillance of potential sources was also conducted.
**Results**: Ninety - eight cases were identified to have infection and/or colonization with *Clostridium difficile*. Majority of the patients who developed *Clostridium difficile* infection was in critical condition and had received multiple antibiotics for a prolonged period of time. Effective infection control strategies implemented to control the outbreak included: early identification of *Clostridium difficile* infection cases through empowerment of nurses and resident doctors to screen patients and order institution of isolation precaution policies; cohort of patients with *Clostridium difficile* infection and strict monitoring of environmental cleaning and disinfection. Implementation of the antimicrobial stewardship program with introduction of "reminder stickers" to limit the duration of antibiotics for specific infections based on local and international guidelines is critical to the success of *Clostridium difficile* outbreak control.
**Conclusion**: Infection control strategies implemented was successful in reducing clostridium difficile infection in the hospital.

PS 1-083

## SURGICAL SITE INFECTIONS AFTER ORTHOPEDICS OPERATION: OUTBREAK INVESTIGATION AND SURVEILLANCE

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**Purpose**: Surgical site infection (SSIs) is one of the major complications after the operation, the infected wounds may induce amputation, got higher mortality and increased medical expenses. In June 2012, surgeons have announced abnormal increasing SSIs and recognized by infectious disease physician, the risk factors of increasing infectious rate were unknown. The goal of this study was to determine the causes of increased post-arthroscopy SSIs and to define risk factors of infection.
**Methods**: Demographic, clinical, and microbiological data were collected on post-arthrocopy SSIs from January, 2012 through December, 2013. Risk factors for SSI were identified by case-control analysis and presented as odds ratios (OR) and 95% confidence intervals (CI).
**Results**: SSIs notification process was set up and reward system to encourage employees to take the initiative to inform. Several directions were analyzed including the behavior of staff, environment and equipment. Higher humidity (70 to 75%) was noted in surgical instrument storage room, positive bacterial culture results in equipment package and air conditioning vent. We added a new dehumidifier to reduce humidity outside, whoever, the surgical packages were not entirely dry after autoclave sterilized, so the surgical instrument packages were shift sterilized to the central supplying room.
**Conclusions**: If surgeons didn't announced or sent bacterial cultures of suspecting surgical wound infection, that the infection control division was difficult to find infectious cases and investigated potential outbreak. The sporadic cases were improved within six months after the outbreak, ongoing surveillance and long-term follow-up are helpful in infection control interventions.

PS 1-084

## MOLECULAR TYPING OF HEALTHCARE-ASSOCIATED INFECTION STRAINS WITH RANDOM AMPLIFIED POLYMORPHIC DNA METHOD BY TWO TYPES OF CAPILLARY ELECTROPHORESIS ANALYSIS

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**Purpose**: Healthcare-associated infections (HAI) are that became clinically evident after 48 hours of hospitalization and do not originate from patient's original admitting diagnosis. These infections cause significant morbidity and mortality and have a considerable impact on healthcare costs. The differentiation of clonal similarity between potential outbreak strains is very important. The Random Amplified Polymorphic DNA (RAPD) is an inexpensive yet powerful typing method for many bacterial species.

**Methods**: In year 2014, there were three potential outbreaks caused by 10 strains of Vancomycin Resistant *Enterococci*, 11 strains of Methicillin-resistant *Staphylococcus aureus*, and 6 strains of *Klebsiella pneumonia* in our hospital. The RAPD was performed by using 6-carboxyfluorescein (FAM)-labelled and non-labelled primer mixture. After PCR amplification, the products were analysed by 3500 Genetic Analyzer (Applied Biosystems) and Qsep100 DNA Analyzer (BiOptic Inc.).
**Results**: The RAPD patterns were almost identical between strains isolated from the same patients. The FAM labelled PCR products can be easily detected and clearly differentiated by 3500 Genetic Analyzer for size less than 500 bps. The total PCR products with FAM labelled and non-labelled DNA can be easily detected and clearly differentiated by Qsep100 DNA Analyzer for size up to 5,000 bps stained with EtBr.
**Conclusions**: The RAPD typing method still have highly reproducible results so long as well quality and concentration of template DNA, concentrations of PCR components, and the PCR cycling conditions. In this study, we successfully typed HAI strains by using RAPD method analysed by fluorescent or EtBr-labelled capillary electrophoresis system.

## PS 1-085

### INVESTIGATION AND MANAGEMENT OF A CLUSTERING OF THE HEMODIALYSIS UINT IN A TERTIARY TEACHING HOSPITAL

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**Purpose**: A cluster of influenza like illness took place in the hemodialysis unit of a tertiary teaching hospital was self-reported at 19th August 2013 which prompted this investigation and this cluster was soon halted after intervention. Here presents the details of this investigation and investigation.
**Methods**: An investigation was started for the endemic situation of flu like illness among the staffs of the hemodialysis unit and the renal patients August 1st 2013. The adherence to the employee health management and infection control policy was especially accessed.
**Results**: During the period from August 8th 2013 to August 16th 2013 a total of 8 staffs (one doctor and 7 hemodialysis technologists) and 3 renal patients experienced fever and flu like symptoms including cough, myalgia, and diarrhea. The symptomatic staffs searched medical help by themselves. Influenza A infection was diagnosed in 2 staff based on the result of influenza rapid test. However, they neither informed the colleague and the supervisor nor followed the employee health management to report to the health information system timely. In the hemodialysis room the space and timing for dinner are limited which also possibly facilitate the spreading of the flu like illness. Interventions based on the employee health management and the infection control policies were filed after discussion between the infection control unit and the staffs of the hemodialysis unit. No new case of flu like illness among the staff and renal patients visiting the hemodialysis unit was noticed till August 24th 2013 and this investigation was then closed. During the following year (from September 1st 2013 to August 31th 2014) a total of 4 staffs of the hemodialysis unit suffered fever and flu like symptoms at different month during this period.
**Conclusions**: This investigation underscores the importance of strict adherence to employee health management to prevent the spreading of highly contagious disease in the working space.

## PS 1-086

### THE EXPERIENCE IN DEALING WITH A CLUSTER OF INFLUENZAE A OCCURRED IN DIALYSIS CENTER IN A REGIONAL HOSPITAL

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**Purpose**: On August 5, 2013, a patient who infected influenzae A occurred in Dialysis Center (DC) in our hospital, Tainan Municipal Hospital. We therefore took immediate actions of investigation and found 7 persons (4 patients and 3 registered nurses) had the symptoms of influenzae. After the investigation, we adopted the necessary measures of epidemic prevention and hoped this experience could be provided to the hospitals as reference of disease prevention and cure.
**Methods**: Once notification received in Infection Control Room(ICR), actions taken immediately were (1)to trace conditions of both patients and epidemic, (2)to adopt droplet precaution, (3)to emphasize on hand washing, (4)to place the infected patients in the isolation room and proceed hemodialysis, (5)to open the windows in the ward of DC, (6)to ask the infected nurses to take a seven days' leave, (7)to reinforce environmental cleaning and disinfection, (8)to dose those who contacted with infected persons with Tamiflu prophylactic medicine, (9)to collect specimens of the 4 patients and send them to Centers for Disease Control(CDC) for inspection.
**Results**: Through the investigation, we found the infected persons didn't fully implement hand washing and masks wearing. The major symptom of the 7 persons was fever(85.7%) as well as the minor one was cough(71.4%). 6 persons were confirmed influenzae A(85.7%) by the influenzae rapid screening. All the results of the 4 specimens inspected by CDC were influenzae virus type swH1. No new cases occurred on August 12.
**Conclusions**: Vaccine is recognized worldwide as the most effective way to prevent influenzae. This cluster was rapidly controlled within one week. The causes we analyzed are non-implementation of cough etiquette and hand hygiene. In the future, we shall raise vaccination rates and implement measures of infection control to prevent spread of the epidemic.

## PS 1-087

### INVESTIGATION AND MANAGEMENT OF SEVERAL CASES OF *K. PNEUMONIAE* CARBAPENEMASE PRODUCING ENTERIC BACTERIAL COLONIZATION OR INFECTION

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**Introduction**: This case study and management was initiated by documented occurrence of *Klebsiella pneumoniae Carbapenemase* (KPC) producing enteric bacteria in a medical center in Northern Taiwan. The KPC enteric bacteria were detected during an epidemiology study by Center for Disease Control(CDC), Taiwan, for Multi-Drug Resistant microorganisms in year 2012.
**Methodology**: CDC, Taiwan, reported 26 cases with KPC bacteria of this medical center from January to October 2012. For the cluster of 8 in September and October, seven of them were in the wards of Chest Medicine. The infection control team took actions, including educational training for better KPC awareness, intensified antibiotics stewardship program for units of Chest Medicine, increased housekeeping cleansing frequency, re-enforcement of contact protection, and KPC screening for contacts and the environment.
**Results & discussion**: After the intervention, the conforming rates for contact isolation and environmental cleansing have been optimized to 100%. The yielding rate of carbapenemase-resistant K. pneumoniae (CRKP) in sputum was 0% in an investigation in early November. Hand hygiene practice reduced the CRKP positive rate to 9.6% (3/31) in December among medical professionals, with none of them positive for KPC. CRKP positive rate in the environment vicinity of KPC cases had been 4.1%(2/48), with none of them positive for KPC. CRKP was on the drawer handle and the bed railing. The positive rate was reduced to 0%(0/8) after intervention. CRKP positive rate was 3.6%(2/55) in Chest Medicine Ward, also with no KPC. Positive spots were the microwave control panel and the lid of ice machine lid.
**Conclusion**: Hand hygiene and environmental cleansing are very important. KPC cased should be tagged and isolated for awareness, with medical equipment for use exclusive to them. Rotating personnel have to be well educated. Reported KPC cases have been reduced to one per month up to May, 2014.